Commonwealth of Kentucky
Division for Air Quality

EXECUTIVE SUMMARY

FINAL
TITLE V/Synthetic Minor PERMIT NO. V-05-050 R2
ELECTRO CYCLE, INC.
MADISONVILLE, KY
January 10, 2009
HOSSEIN RAKHSHAN, REVIEWER

SOURCE I.D. #:	21-107-00121
SOURCE A.I. #:	1880
ACTIVITY #:	APE20080001

SOURCE DESCRIPTION:

On April 16, 2008, the Division was in receipt of modification application from Electro Cycle, Inc. to replace the existing Delacquering Kiln with the new Delacquering Kiln at the Madisonville facility. The new Delacquering Kiln will serve to increase plant wide throughput rates from 4.9 tons aluminum per hour to 7.5 tons/hour except for existing Electric Induction Furnace, which remains at the current rate of 4.9 tons/hour.

Electro Cycle, Inc. is a secondary aluminum alloy ingots production plant. The source is located in Madisonville, KY and produces alloy ingots for the metal casting industry. The source melts and alloys a variety of recycled aluminum products to produce these ingots. The transforming of recycled aluminum scrap into alloy ingot at the source is a four-step process. These steps are: scrap receiving, scrap shredding, delacquering kiln (kiln) processing and induction furnace melting.

The source melts several types of scrap in the induction furnace. These include industrial scrap from can manufacturers that arrives densified either in a bale or a briquette. The source also processes loose extrusion turnings, wheel turnings and can process scrap forms, i.e. extrusion scrap, wheels, etc. Dealer scrap is the only scrap material fed into the kiln that contains the contaminants required for D/F formation. Most material used to make up the charge to the induction furnace is in the form of densified bales or briquettes. This material must be processed further, before it is ready to charge into the induction furnace. This processing begins at the #1 mill (Mac/Saturn-low speed-high torque mill) with 3 100 HP motors in tandem that drive the 2 hydraulic motors. The scrap is conveyed up and into the #2 mill (American Pulverizer-300 HP ring mill) for further sizing. Ferrous scrap is then removed magnetically and the milled scrap is conveyed to the kiln where the organic coatings are thermally removed and passed into the afterburner for ultimate destruction. The afterburner oxidizes the unburned hydrocarbon vapors in the gas stream that is vented from the kiln. The source uses an electrically operated induction furnace to provide the thermal energy to melt the aluminum scrap. The induction furnace has a capacity of 7 tons. Material is charged from the kiln to the induction furnace and the molten metal is poured into sow molds for solidification.

The particulate, acid gas and D/F emissions from the kiln are controlled by a baghouse that uses lime and activated carbon coated bags for additional acid gas and D/F control. The manufacturer specified particulate control efficiency is 99.3% and the afterburner control efficiency is 99.7% for hydrocarbon destruction. The kiln has a rated burner capacity of 6.4 mmBTU/hr and the afterburner has a rated capacity of 4.2 mmBTU/hr. The material exit temperature from the kiln is 750-850 ˚F and the gas

the gas temperature going to the afterburner is 250˚F. The afterburner has an operating temperature of 1400-1450˚F and an exit temperature of 313˚F. The afterburner must operate at a temperature greater than 1400˚F to destroy organic compounds. The induction furnace is also equipped with a bag house for particulate control with manufacturer specified control efficiency of 99.3%.

The potential to emit (as defined in 401 KAR 52:001, Section 1 (56)) of any single HAP is less than ten (10) tons per year and the combination of HAPs is less than twenty-five (25) tons per year. Therefore, the source is not a major source of HAPs . However, the provisions *40 CFR 63, Subpart RRR, National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production,* are applicable to area sources that have the potential to produce dioxin/furan (D/F) compounds.

The potential to emit (as defined in 401 KAR 52:001, Section 1 (56)) of PM10 and VOC is greater than one hundred (100) tons per year. Therefore, the source is a major source and is subject to the provisions of 401 KAR 52:020. The Source is Synthetic Minor for PM/PM10.

U.S. EPA REVIEW:

The U.S. EPA was notified of the issuance of the proposed permit on November 26, 2008 via e-mail. The comment period expired 45 days from the date of e-mail. No comments were received during this period. The permit is now being issued final.